

ABSTRACT

A composite joint for gas-tight members constructed of materials that exhibit different coefficients of thermal expansion is used for supporting a membrane material in a reactor. Broadly, the apparatus provides composite joints which include a girdle of a resilient material disposed between mating surfaces of a high strength metallic member and a nonmetallic member in an arrangement wherein a difference in fluid pressures across the joint provides compressive force upon the girdle through tapered mating surfaces thereby improving resistance to fluid leakage. The composite joints are particularly useful for joining a high strength weldable metallic conduit and a gas-tight ceramic member having a tubular structure, closed at one end, with a tapered mating surface at a distal end thereof contiguous with a portion of the girdle. Processes using such joints include those which convert methane into synthesis gas.